

Wildlife Division

The first attempt at wildlife management, begun in 1939, was the Cooperative Wildlife Management Program. The intent was for the handful of biologists to serve as extension agents for the Department and bring together the landowners and the sportsmen to put wildlife restoration measures on the land. There were chapters of the Conservation Federation in most counties and it was thought they could be encouraged to work with farmers to implement the recommendations of the wildlife biologists.

There were three aspects to the program:

refuges, wildlife management and harvest. The refuges were initially to provide sanctuaries, but emphasis was shifting away from refuges to habitat improvement practices like leaving unharvested strips of grain bordering fields, leaving some strips uncultivated, permitting fence rows to grow up to weeds and brush, building ponds, controlling soil erosion and woods fires, keeping dogs penned during breeding season, eliminating cats and harmful hawks and protecting den trees. With the exception of eliminating cats and hawks, the same practices would work today.



Red-tailed hawks, once thought to be a serious predation threat to game animals, hang on a farmer's fence near Prairie Home in 1947. Farmers who were unaware of hawks value in controlling rodent pests killed them in large numbers even though they were officially protected under the federal Migratory Bird Treaty Act.

A report in December, 1941, showed there were eighty-nine cooperative areas established, of which thirty-three were active, forty-seven passive and nine were deemed failures. It is interesting to note that cooperatives initiated by local sportsmen's clubs had the highest success rate-seventy percent active and ten percent passive. Those initiated by other county groups such as Rotary, Lions, 4-H, FFA and others had the poorest **record**—twenty-six percent active and sixty percent passive. Cooperatives initiated by landowners were only slightly better—twenty-eight percent active and sixty-three percent passive.

The landowners seized upon the refuge aspect of the program because they were anxious to control trespass and unsportsmanlike hunting. The sportsmen, concerned about gaining a place to hunt, preferred the habitat improvement aspects. The Department played down the refuges and urged habitat improvement and harvest by considerate sportsmen.

The war years saw the gradual decline of the program. Sportsmen and farmers alike were in service, as were many of the biologists. The only thing that remained was the pond part of the program. Farmers eagerly seized on pond building as a way to get water for livestock, recreation and domestic use. When federal programs helped with construction costs, the program really blossomed. The farm pond program, which today makes the Missouri landscape different from that of any other state, had its humble beginnings in a habitat improvement program for upland game.

The first biologists divided the state into four parts and were expected to promote wildlife management in their districts. In time, they came to also have statewide responsibilities—c. W. Schwartz for prairie chickens, D. L. Spencer, W. K. Clark and A. S. Leopold for deer and wild turkeys, C. R. Noren and Reed Twichell for furbearers and H. V. Terrill for waterfowl. A. H. Denney had a knack for synthesizing data. He led the way in soil studies in relation to wildlife and produced the state's and nation's first forest cover map.

The Department was deeply interested in large impoundment plans of the Corps of Engineers and Denney began the Meramec River watershed wildlife surveys that were ultimately completed by Bill Crawford. A similar survey was done of the Grand River Basin.

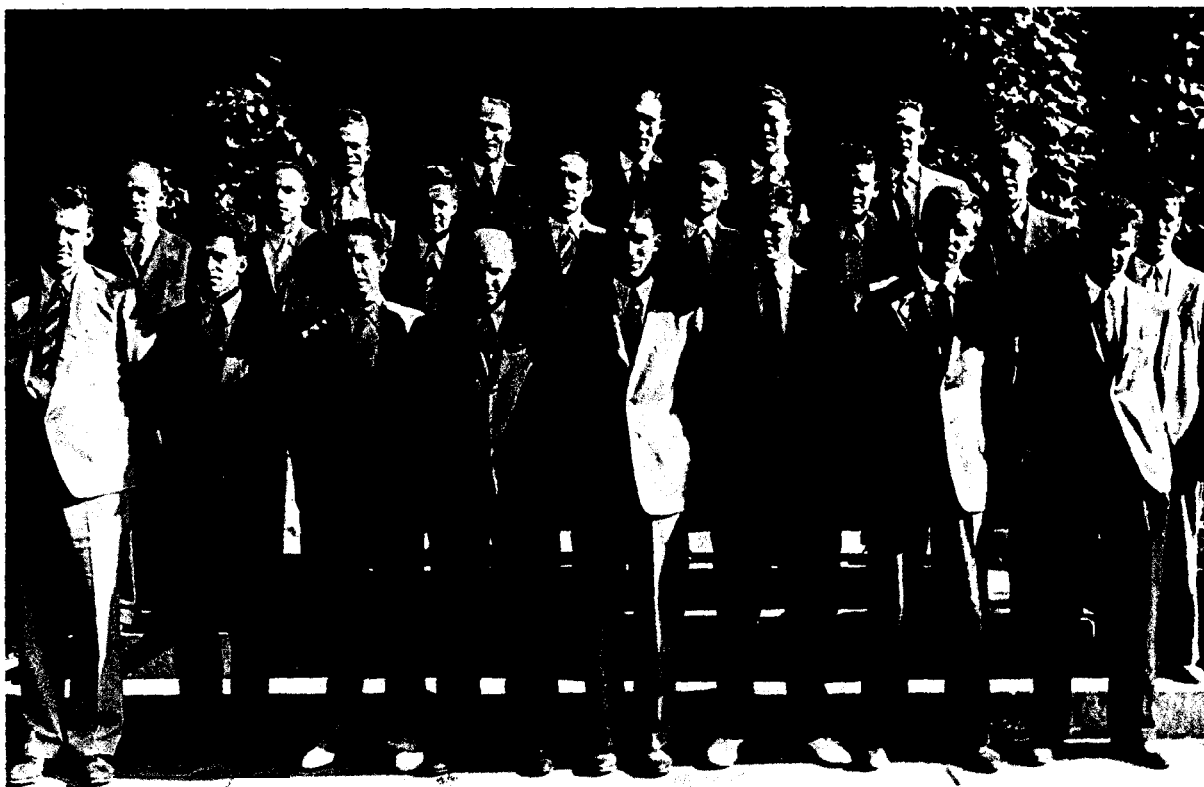
Following World War II, it became apparent that the most effective use of biologists was not in scattered districts, but centered in one place where they could work on specific problems. The Cooperative Wildlife Research Unit at the University of Missouri was a logical partner and research biologists were stationed in Columbia where they had access to laboratories, University personnel and libraries. Administrative biologists remained in Jefferson City as part of the Game Section, created in 1947.¹

The field duties of the biologists—working with various groups to get wildlife practices applied to the land—were taken over by new specialists, the field service agents. First assigned to the Information Division, they were later transferred to the Fish and Game Division.

Bode felt the need for someone to work statewide to sell Department objectives to the Federation groups which had accomplished passage of Amendment 4 and now sought another task. He hired Wallace Gray to assist field men in promoting the cooperative wildlife management areas, conduct public meetings and to essentially engage in public relations.

By 1939, four field service agents had taken over the pond program, arranging for loans of the eighty-eight scrapers purchased by the Department, and working with other agencies involved in the program. The Farm Security Administration funded pipe and fittings for ponds, if they were fenced from livestock to improve conditions for wildlife, and this was an incentive to farmers. In 1942 the Department furnished these materials for 647 ponds and at the same time began providing food and cover plants for wildlife. By the end of the 1940s, construction of approved ponds had reached 1,000 per year. By 1943 there were six field service agents,

¹ Research chiefs have been Lisle Jeffrey (1941-1943), Paul Q. Tulenko (1943-1946), Maurice F. Baker (1947-1949), Bill T. Crawford (1949-1983), Oliver Torgerson since 1983.



Members of the *Federal Aid, Field Service, Game and Refuge* sections in 1940 were, front row, left to right: Lisle Jeffrey, David Spencer, Edgar Biffle, Glenn Pittenger, Starker Leopold, Willard Barbee, Charles Schwartz, Carl Noren; second row: H. E. Baggenstoss, Hugh Denney, Reed Twichell, Paul Tulenko, James Beets, Jr., Harold Terrill, R. G. Ranney, Webster Kim Clark; third row: Cecil Veatch, Wallace Gray, Jay Morrow, unknown (possibly Wilfred Case) and Bruce Lewis.

demand for their services was so heavy.

Meanwhile, the various habitat programs had grown, and better coordination of Departmental and public efforts was needed. In 1944, a separate Field Service Section was created with Jay B. Morrow as its chief, assigned to the Administrative Division.² The function of the new section, in addition to needed public relations work, included handling applications for game and fish management practices, assisting other personnel, and trouble-shooting when misunderstandings arose between different groups and the Department. Their efforts helped people understand the reasons for new policies and programs, eliciting voluntary participation by the

public when needed.

To meet growing demands, the section grew to eleven full-time field men, one in each of seven districts, one each for Kansas City and St. Louis, one to work on the extension balanced farming and soil conservation district programs, and one on statewide assignment to improve areas around farm ponds and develop techniques to assure long life and multiple uses for these small impoundments.

With reorganization of the Department in 1947, the section was transferred from the Administrative Division to the newly-created Field Division, along with Protection. Kenneth R. Hicks became Field Service chief as Jay

² Field Service chiefs have been Jay B. Morrow (1944-47), Kenneth R. Hicks (1947-1955 and 1958-1974), Kay M. Wells (1955-1958), and Sam B. Kirby since 1975.



The Field Service Section, circa 1949. Front row, left to right: Otis C. Thorburn, Harry Bruton, Section Chief Kenneth R. Hicks, Richard H. Rotsch and Ray M. Wells. Back row: Leonard Rowe, J. Lewis Berrey, A. R. Mottesheard, Robert R. Bright, Fred Bickel, Ran C. Barrett and Cecil Davis.

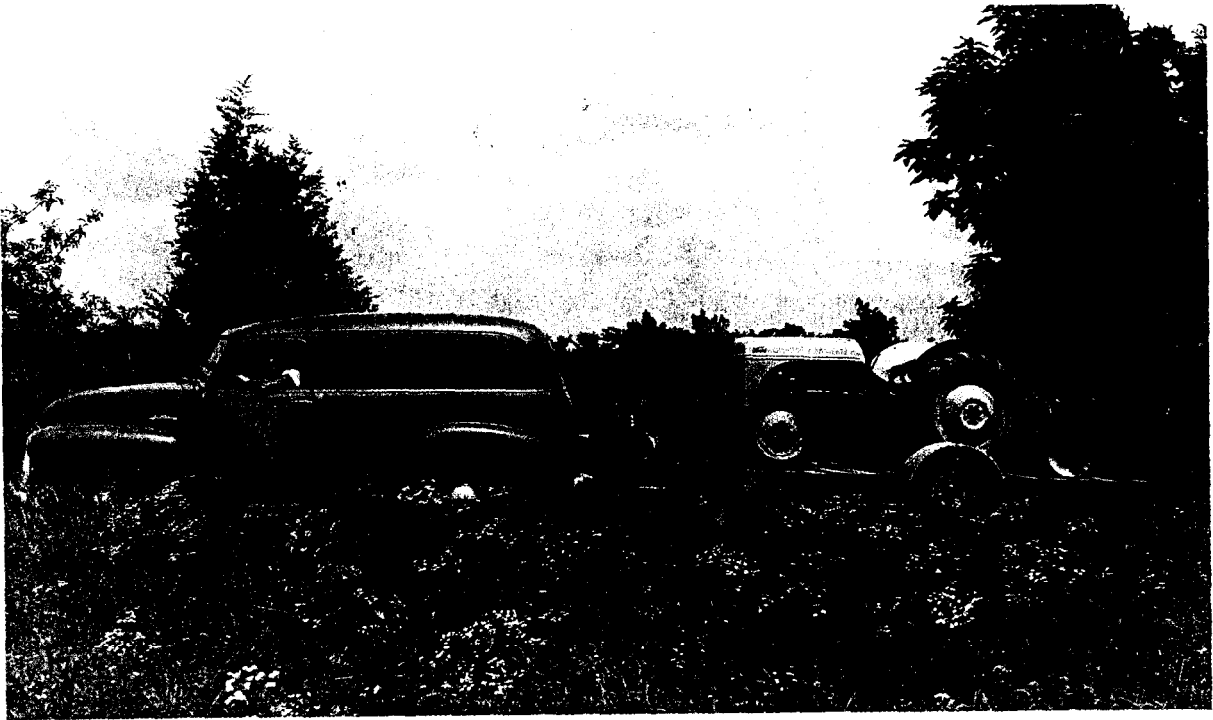
Morrow became Field Division chief. It was about this time that field demonstrations began to be widely used, and this approach required coordination with other land management agencies. Field Service agents found themselves playing the role they still follow—coordinators with other agencies in soil and water management plans, as they became the base for wildlife habitat development.

Work with youth groups, like 4-H and FFA, resulted in wildlife conservation practices becoming approved activities within those organizations. In the 1950s, special projects were designed for FFA chapters. One of these, developed under sponsorship of the Sears Roebuck Foundation, was the first of 'its kind in the nation. A total of 103 chapter projects, each involving three to five acres, which included a pond and eroded area, were completed with the guidance of a Field Service

agent. Work included summer youth camps and 4-H club meetings.

Also during the 1950s, the Field Service staff worked with the federal Production and Marketing Administration to bring about subsidy payments for creation of wildlife habitat. For the first time in Department history, all land management agencies gave uniform approval to practices the Department recommended in farm programs. Field Service redesigned its programs to promote wildlife programs through state and federal agricultural agencies, farm organizations, individual farmers and interested sportsmen's groups. Inter-agency work became the order of the day.

The Soil Bank program in 1956-57 opened another door. Field Service developed a relationship with the ASC (later ASCS, Agricultural Stabilization and Conservation Ser-



Early wildlife food and cover restoration programs leaned heavily on demonstration areas. Biologist Richard W. Vaught and his Ford tractor helped develop such areas.

vice) which resulted in subsidies for approved wildlife practices on acreages diverted from cropland to grasslands. Annual food plots which had to remain uncropped for ten years were planted extensively. In 1958, Field Service's work under the Soil Bank program won recognition as the nation's outstanding wildlife conservation extension program.

Wildlife management plans for individual farms became equally popular, and by 1960, field work became directed more to practical applications created by research biologists' findings.

In 1977, Field Service was transferred to the Wildlife Division, though it continued to be involved in some Fisheries work for a time. An extensive pilot Private Land Program project was begun in 1981, to document and evaluate the results of several program elements. Two demonstration farms were established to show how farm management practices produce economic returns, soil erosion control and wildlife benefits. Two specialists were assigned to incorporate wildlife in SCS "critical erosion control areas," and other



Field Service agents like Paul Jeffries worked with individual landowners interested in improving conditions for wildlife by providing them with management plans tailored to specific needs.

specialists worked on programs in three counties where intensive wildlife practices were promoted. An agricultural liaison position worked with state and national agricultural programs and policies full-time.

Beginning in 1986, guided by the evaluation of the five-year study program, several organizational changes occurred. The name of the section was changed from Field Service to Wildlife Services. Field Service agents became Wildlife Services biologists, and private land specialists were assigned to work directly with SCS to represent wildlife resources. A special native warm-season grass program, now expanded to a grassland management program, offers technical advice, equipment and services to Missouri farmers. Improved pastures translate into improved wildlife habitat.

Wildlife Services biologists continue to apply biological principles to land management, and to coordinate Department programs with other agencies. They prepare individual management plans, provide technical advice, seed and nursery stock, and evaluate wildlife habitat conditions on private land. They conduct short courses to show landowners how to plant trees and shrubs properly, how *to* improve pastures and cropland for wildlife, and generally how to improve habitat without lowering farm income. In a typical year, Wildlife Services biologists administer the Planning Ahead for Wildlife Survival (PAWS) program through conservation agents, involving 12,665 cooperators on 6,298 farms. Nearly eighty-nine tons of seed, 1.2 million plants and 2,700 special bundles are allotted to cooperators for an estimated 16,030 acres of land. Wildlife Services biologists continue to do camp work, conduct youth and adult meetings and handle public relations problems.

Working closely with the SCS and coordinating efforts with the Wildlife Services biologists, the private land specialists work with more than 150 SCS employees, helping them improve thousands of acres of farm land for quail and other wildlife, as side benefits to farming. They train SCS personnel to conduct wildlife habitat appraisals and to correctly use that information to improve wildlife habitat. They help SCS organize and imple-



Promotion of native warm-season grasses is a major aspect of the Department's habitat improvement program. Biologist Randy Arndt stands by a sign at the Seat Demonstration Farm in Worth County.

ment public information programs and assist with exhibits, tours, demonstrations, news articles, publications, radio and television programs.

The extension wildlife damage control program begun in 1945 is now a part of Wildlife Services. This popular program teaches landowners how to control nuisance animals, from blackbirds to deer.

The traditional responsibility for small impoundment management was transferred to the Fisheries Division to focus more staff time on non-aquatic wildlife programs for private lands. Even with the transfer of Fisheries duties, the reorganized Wildlife Services Section represents a wide spectrum of direct and indirect services to Missouri landowners and related agricultural agencies.

Meanwhile, both the general and special-subject biologists had been pulled into Columbia to work on projects needed for program development. It was the organizational basis of what was to become the Wildlife Research Section. First quartered in the University's



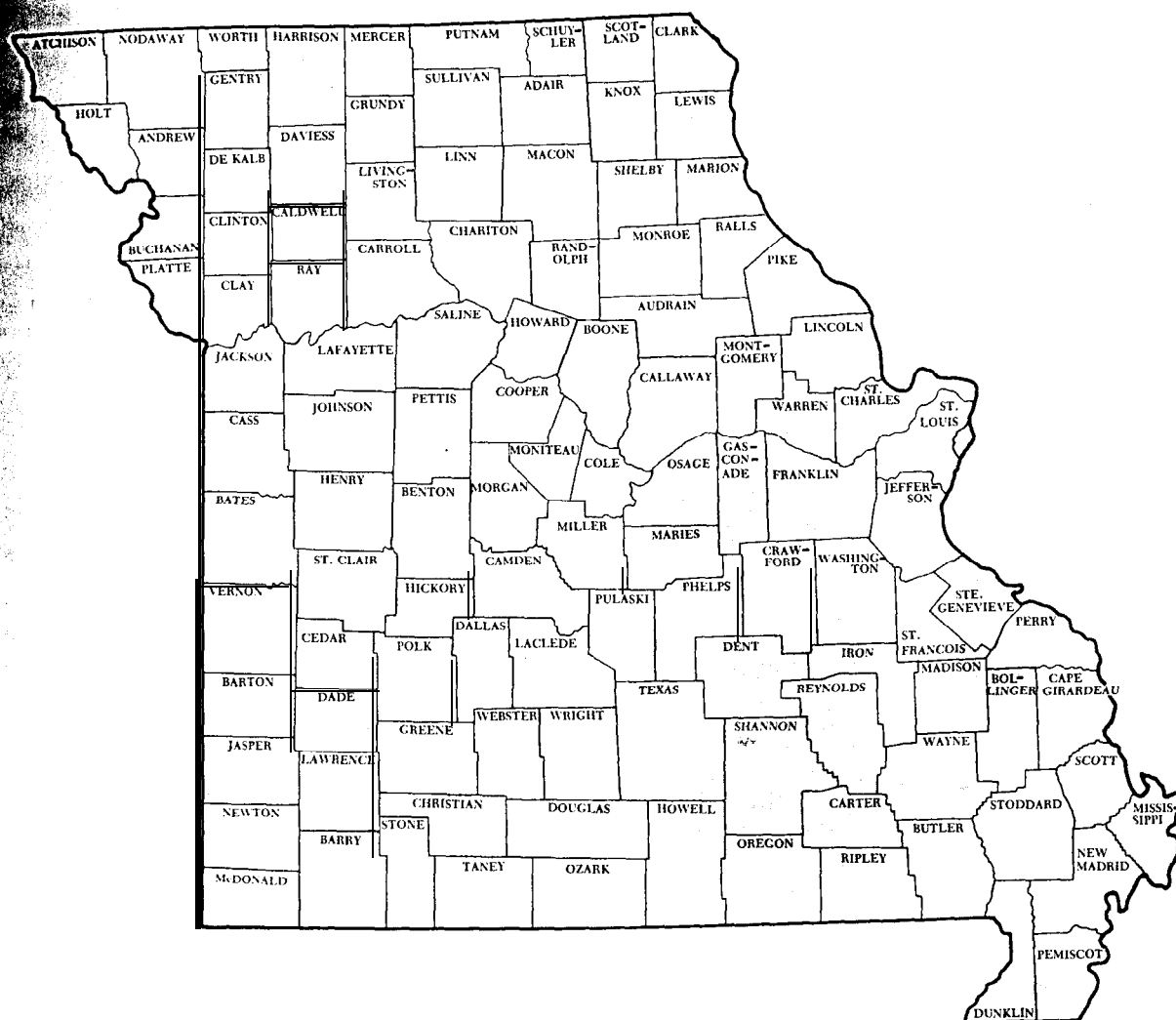
Deer restoration was beginning to show results when this 1946 photograph was taken at Eleven Point Refuge in Oregon County. Estimated deer populations grew from 5,000 in 1939 to 15,000 in 1944. Deer Biologist Dunbar Robb is in the back row on the extreme right; early researcher Dr. Paul Dalke is in the front row on the extreme left.

Wildlife Conservation Building (Stephens Hall), they later occupied rented quarters elsewhere in Columbia until, in 1970, they at last moved to the Fish and Wildlife Research Center, built by the Department to house their offices and laboratories. Their jobs were to get the facts upon which wildlife management might be based, although at first the distinction between research and management was often blurred. There was so much to be done that they tended to work on the more obvious, immediate and less complicated problems.

In the period before World War II, major research efforts concentrated on deer and wild turkey restoration. The deer program consisted of developing refuges where fertilizing of food plots, predator control, protection from fire, grazing and poaching were used to increase animal production. Deer responded dramatically. Studies of soil in its relation to

wildlife showed that animals on better soils were larger, bigger-boned and produced more healthy young than those on poorer soils. Deer were live-trapped and released on areas where local conditions promised their survival. Protection by the increasingly efficient conservation agents, gradual suppression of wild fires, better timber management, grazing control, and cooperation by local people were important factors in deer restoration.

This program progressed so well that biologists recommended having an open season in 1944—deer hunting had been closed following the 1937 season. Agents' estimates of deer numbers in 1939 had been about 5,000 animals; in 1944 they estimated 15,000 deer as a result of restoration efforts. A two-day buck season in twenty counties resulted in a legal kill of 519 deer by 7,557 resident hunters. From then on progress mushroomed. By 1950, a six-day season in fifty ^{counties}

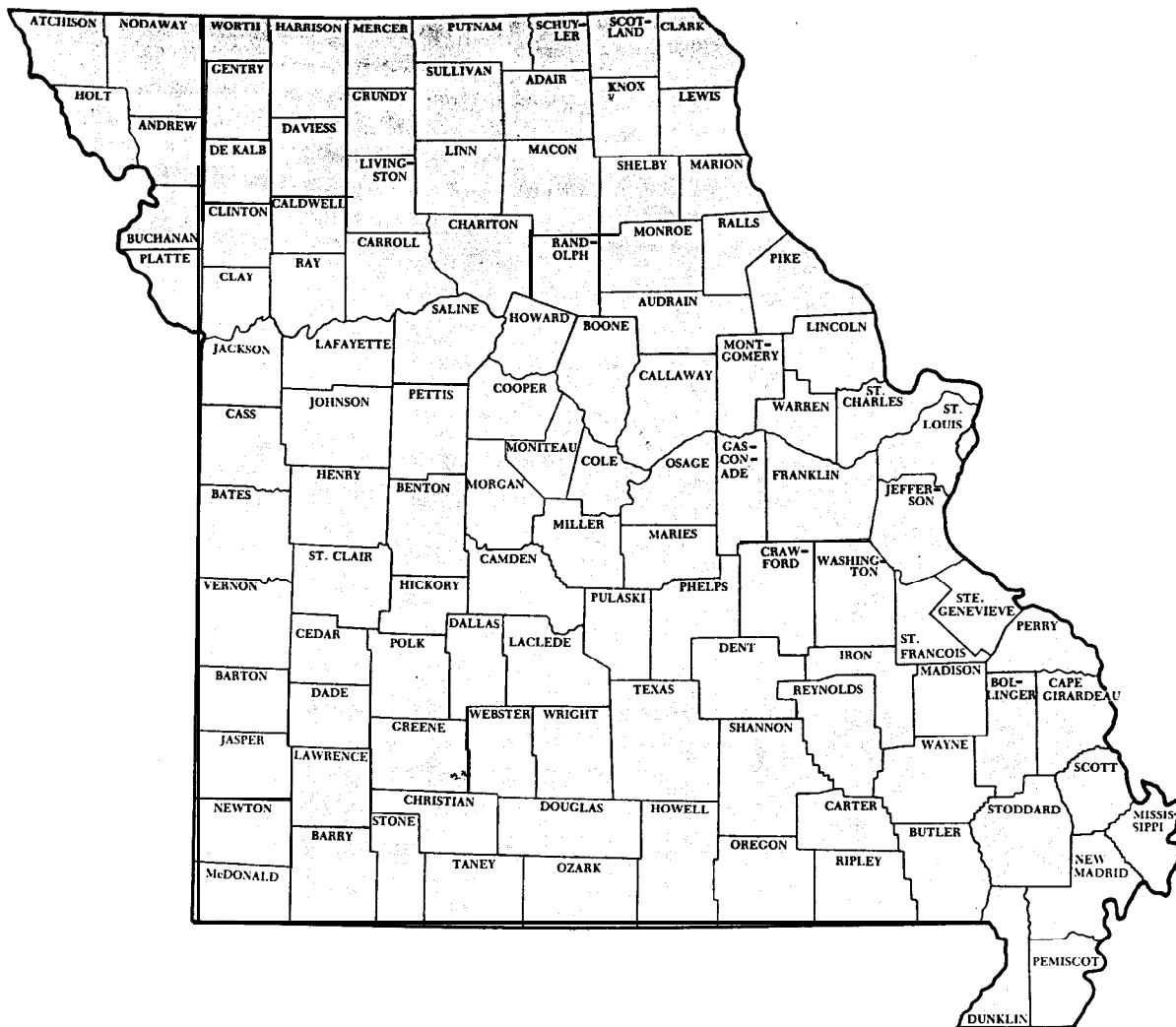


A map of the deer range in 1934 shows isolated pockets of deer in a few remote areas of the state.

was possible. In 1951, the first "any-deer" season was instituted. The following year the first north Missouri counties were opened to deer hunting, and in 1957, non-residents were permitted to hunt deer. In 1957, it was announced that deer restoration programs would be concluded. The deer herd's continued growth was assured. By 1958, hunters were bagging as many animals during open season as had existed in the state when legal hunting resumed in 1944. Future management of deer would focus on maintaining desirable population levels and controlling deer where they

posed problems to landowners.

On the wild turkey front, A. Starker Leopold's research proved "wildness" was a heritable characteristic; since semi-wild turkeys lacked this they could not survive. For a number of years B. K. Leach, a lumber company executive, had been experimenting with breeding of semi-wild birds-crosses between domestic and wild turkeys-but survival had been disappointing. Fortunately, releases of the semi-wild birds were not made close to remnant flocks of native Missouri wild turkeys; hybridization would have been detrimental to



In sharp contrast to the 1934 map, the deer range in 1959 was statewide except for small areas in extreme southeast and southwest Missouri.

the native stock. Various releases of semi-wild birds were continued under carefully controlled conditions, but in every case were unsuccessful.

Studies revealed that by 1952, wild turkey numbers had hit bottom, estimated at fewer than 2,500 birds. In 1954, the Department embarked on active turkey management aimed at restoring turkeys to suitable but unoccupied range. The turkey program was shifted from research to management. Out of the research of Leopold, Ken Sadler and John Lewis, management efforts concentrated on

increasing the native turkey populations by live-trapping them and stocking where habitat conditions were improved and local sentiment favored the releases. The same techniques that were successful in deer restoration went into the turkey program. Allen Brohn established and initially directed turkey restoration as a management program, which consisted of locating suitable unoccupied habitat and securing local citizen support of restocking efforts.

Wild turkey habitat in refuges was improved by creation of openings and water



Biologist John B. Lewis, right, bands a turkey as part of research to determine the birds mortality and mobility. The turkey restoration effort eventually led to statewide open seasons with legal harvests topping 50,000 birds annually.

holes, two items research had revealed were necessary to turkey production. On 45,000 acres of forest land committed to the program, attempts were made to create an opening and a water hole for each eighty acres of land. At first, live-trapping was done with traps similar to deer traps or pen traps—both inefficient ways to trap numbers of turkeys—until Biologist Kenneth Sadler adapted the cannon-net trap to capture turkeys in 1953. Biologist John Lewis further refined trapping techniques and from then on turkey restoration dramatically speeded up. The cannon-net trap had been devised by two federal employees at Swan Lake National Wildlife Refuge in 1948, to trap waterfowl for banding studies. Ken Sadler saw the possibilities for more efficient turkey trapping and adapted it for that purpose. Instead of trapping one or two birds at a time, the number of birds caught for restocking increased markedly. The way was clear to speed up turkey restoration.

Then the Department took a calculated risk. It was apparent that a major factor holding back turkey restoration was poaching. It was reasoned that if hunters could be convinced that turkeys were in fact being restored, it might increase landowner interest and cut down on poaching. In 1958, John Lewis recommended an open season, but it wasn't until 1960 that the Commission assented to a three-day season in fourteen counties, the first open season on wild turkeys since 1938. The scheme worked and open seasons and the turkey comeback continued until today we have statewide open seasons with legal harvests topping 50,000 birds annually.

More than any other wildlife program, turkey restoration is dramatic proof of how research and management can bring back a species from near-extinction to abundance. A great deal of credit must go to refuge personnel who refined the techniques, trapped deer and turkeys, and released them over the



In a 1950s era photograph, Lewis touches off a cannon net trap detonator. Refinements in the trap have resulted in lighter nets that are propelled by rockets instead of cannons, and battery detonators.

years. These are truly unsung heroes.³

Another major wildlife management program begun in 1948 was cover restoration. It was learned that a major factor limiting quail was a lack of suitable cover and food: in north Missouri cover for protection from predators and harsh winter weather was deficient, while in southern Missouri quail lacked desirable food plants. The Department had been making Korean lespedeza seed available to any cooperators who would plant it and had been promoting food and cover as part of the pond program, but in July, 1948, it launched a formal cover restoration program. Biologist Edgar B. Biffle was supervisor. The state was divided into seven districts, where a number of new biologists got their indoctrination into conservation work. Included were August F. Artus at Pleasant Hill, later to manage the Upper Mississippi Wildlife Area, Kenneth C. Sadler at Chillicothe, who would later make important contributions to the turkey program and become research super-

visor, and William McDannold at Shelbina, who later would manage the Pony Express Wildlife Area.

Biologist Harold Terrill, working with the SCS and Extension Service, suggested multiflora rose as an excellent wildlife food and cover plant and sericea lespedeza as a cover and emergency food plant. These two plants, plus Reed canary grass which also provided erosion control, became the basis for the wildlife cover program; landowners were contacted in each district and urged to create rose plantings as farm fences and to seed sericea and Reed canary grass in odd areas where it would provide food and shelter for wildlife following heavy snows. Field Service agents and conservation agents were enlisted to help push the program. The Forestry Division's nursery provided the rose seedlings which were made available at cost to interested landowners. Agricultural agencies and commercial nurseries also promoted use of multiflora rose. In 1952, the U. S. Department



Biologist Allen Reed Twichell (standing next to car window on left) delivered a load of Korean lespedeza seed to this group of Irondale residents as part of the cover restoration program.

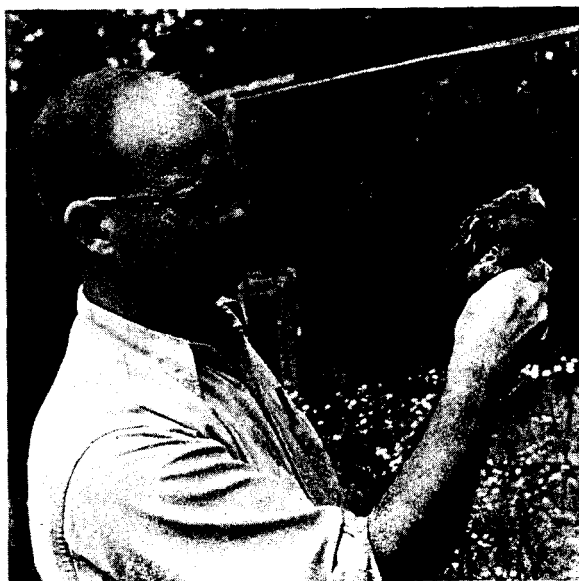
³ Refuge workers involved in deer and turkey trapping include Albert G. Adams (1945-1961), Arley F. Blackwell (1937-1958), Otto Bower (1938-1958), Monte D. Burch (1965-), Lyman J. Chronister (1940-1965), Charles E. Coatney (1943-1975), Herbert F. Davis (1939-1974), A. Bernice Morrison (1957-1968), Ray L. Woodring (1941-1969).



Hugh Steavenson, manager of the SCS plant nursery at Elsberry, inspects a two-year-old planting of multiflora rose. Initial impetus for multiflora as a living fence came from the SCS and was adopted by the Department for wildlife habitat.

of Agriculture approved planting multiflora rose as a living farm fence and for erosion control as a cost-shared practice in the Agriculture Conservation Program.

Tons of sericea lespedeza seed and millions of multiflora rose seedlings found their way onto Missouri farms. The rose provided fences reputed to be "horse high, bull strong and hog tight." It also provided food, and



Jack Stanford, Department biologist from 1946 through 1981, became a nationally recognized authority on bobwhite quail.

escape and loafing cover for quail, songbirds and rabbits. It wasn't until a number of years later that some of multiflora rose's less attractive features became evident. It was found that unless carefully controlled it would escape to pastures where it became a liability. Nevertheless, it did its job. Eventually, the Department dropped multiflora rose from the program and even entered rose control programs with a number of counties.

The food and cover restoration efforts of the Department continued to evolve as part of various programs in the Wildlife Services Section. The loss of farm game habitat from various causes is still a challenge to wildlife managers. It has led them into such activities as promotion of warm season grasses and development of trailing soybeans in attempts to offset habitat losses.

The cover restoration programs had restoration of habitat for quail as their primary target. Few species have been studied as thoroughly as quail and in Missouri that has been the work of Jack A. Stanford. From August, 1946, until his retirement in December, 1981, quail have been Stanford's principal occupation. One of his early research efforts was a study of quail stocking versus natural production, which laid to rest forever the notion that quail could be brought back to abundance by release of pen-reared birds. He proved that if habitat conditions are right for quail, they will fill those coverts naturally. Without adequate habitat, released birds will not survive. He proved that each year there is a forty percent loss of carrying capacity from November 1 to January 1, and that the autumn population of quail will decline by seventy percent, whether quail are hunted or not. Stanford developed techniques to assess quail populations which became an early basis for setting hunting regulations.

Between 1956-58 an exotic species, coturnix quail, was studied to determine its adaptability to declining bobwhite habitat, largely in northern and western Missouri. There were releases of 37,972 coturnix quail in fifteen areas, but they were unsuccessful. Other exotic game bird studies involved Reeves pheasants, Iranian black-necks and Korean pheasants obtained through the U. S. Fish and Wildlife Service. None of them showed any



The Department experimented with coturnix, or Japanese, quail in the 1950s in e/orts to find species that could adapt to less than ideal quail habitat. The coturnix proved to be too migratory and unsuited for Missouri conditions.

real promise, but ring-necked pheasants already in Missouri began to extend their range, permitting limited open seasons since 1954. Missouri has traded turkeys for wild-trapped pheasants with Iowa to speed up the extension of pheasant range, and the legal bag in recent years has exceeded 46,000 birds.

The cottontail rabbit has occupied an unusual position in Missouri wildlife annals. It had little consideration as a game animal until 1953, when the first season and limits were established. Prior to that time it was hunted for sport, of course, but millions of rabbits were commercially harvested each year for release in eastern states or as meat in the dead rabbit trade. The live-rabbit trade was discontinued in 1954, and the dead-rabbit trade a year later. There were three species of rabbits in Missouri in addition to the cottontail: the swamp rabbit, whose numbers quickly declined as wetlands were drained

and is now completely protected; the white-tailed jackrabbit, known from northwest Missouri and now thought to be extinct in Missouri; the black-tailed jackrabbit, formerly fairly common in the western prairies of the state, but now considered rare and possibly endangered. The cottontail remains, but no longer in the numbers that were once estimated at ten million or more annually. They are widely distributed in the state but the northeastern riverbreaks, western Ozark border and western prairie regions probably have the best populations.

C. W. Schwartz researched the home range and breeding season of cottontails in 1942, which was the basis for later studies. Kenneth Rowe was assigned to rabbit studies in 1946, and he developed censusing techniques used for many years. Howard Wight investigated causes of rabbit population changes, and Kenneth Sadler continued and expanded

WHAT HAPPENS TO COTTONTAILS IN MISSOURI

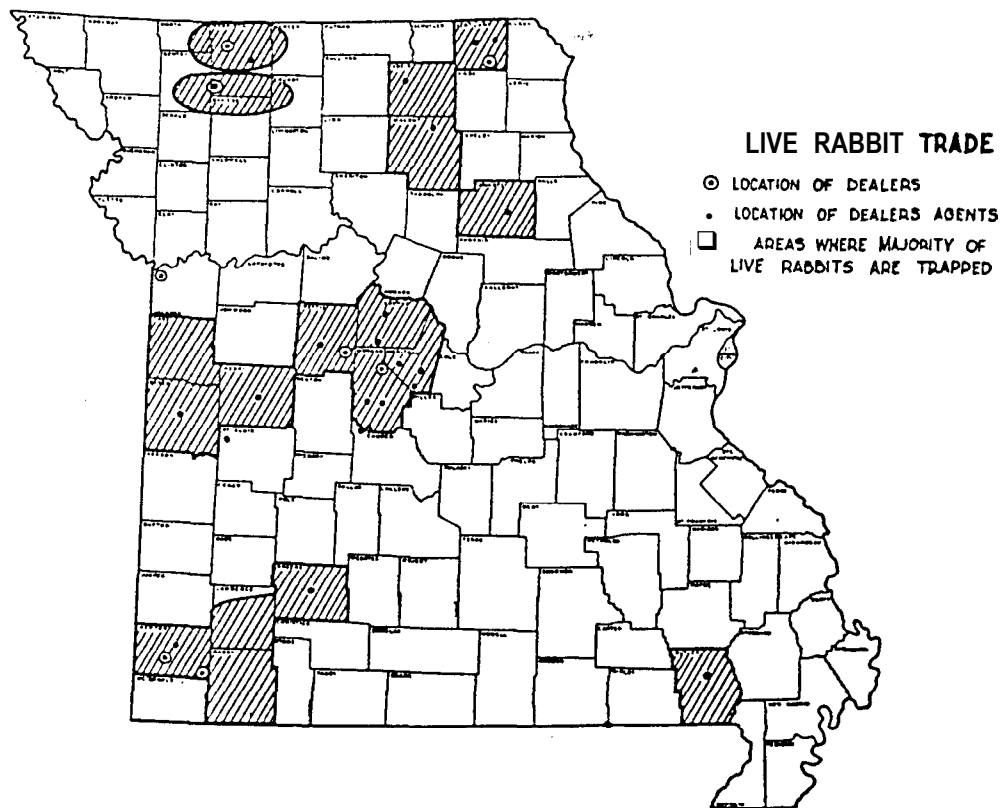
200,000 LIVE RABBIT TRADE

2,800,000 DEAD RABBIT TRADE

3,000,000 MEAT & SPORT HUNTERS

6,000,000 DESTROYED BY PREDATORS & MISCELLANEOUS CAUSES

4,600,000 ANNUAL BREEDING RESERVE



This 1942 map shows mortality causes and location of major rabbit trade activity.

these studies.

Rabbits tend to be cyclic, with years of population highs followed by low population years. But the overall trend has been downward as farming methods have changed the habitat. Where Missouri once had smaller farms with croplands, pastures and hay fields of mixed components, it now has larger and fewer farms, with pastures essentially of fescue grass. The bulldozing of Osage orange hedge-rows also has played a part in rabbit decline, but the cover restoration programs for quail can be of help to rabbits as well.

Furbearers in Missouri have made dramatic comebacks since 1937, in some cases. Raccoons and beavers especially have increased. When the Commission was established it was believed that raccoons might be on the way to extinction in Missouri; the beaver was already essentially gone.

Carl Noren was assigned to raccoon research. He devised a tagging and quota system for raccoon hunters and trappers that was a factor in their restoration. Probably even more important was World War II, which took many of the hunters and trappers out of the fields and forests for a few years. Curbing wildfires and vigorous law enforcement played a role, also. Raccoon harvests rose from an average of 25,000 between 1935 and 1946, to an average of 96,000 the next ten years, up to 136,000 by 1966. In 1985, the raccoon harvest was over 428,000 animals, mostly taken by hunting.

Frank W. Sampson took over furbearer studies in 1947, and followed them until his retirement in 1977. He found that with the exception of raccoons and foxes, which are hunted as much or more than they are trapped, other furbearer harvests are governed more by economics-the worldwide price paid for pelts-than by sporting factors. Undoubtedly some trapping is done for sport, but the sale of fur pelts is most important; the number of people engaged in trapping in any given year will depend on fur prices. Beaver populations have returned to the point they sometimes become nuisances, as trapping pressure for them is light. Spotted skunks have declined, badgers and coyotes increased. Other species hold their own, despite widespread changes in their habitats and changes



Furbearer Biologist Frank Sampson with muskrat pelts in a 1950 photo. Sampson's research showed that fur harvest levels were influenced by market prices for pelts.

in human efforts to hunt or trap them.

One wildlife research effort that paid off in two ways was the development of a precipitin test by Allen Brohn and LeRoy Korschgen. Conservation agents were occasionally foiled in deer poaching cases when they seized dressed or packaged meat but could not positively identify it as deer. Brohn and Korschgen developed a test that definitely identified deer meat. It is a laboratory procedure in which sensitized serum can distinguish deer blood or venison, even in trace amounts, from meat or blood from other animals. The test was acceptable in court as evidence and the agents had a new tool in their arsenal against game law violators. Development of the precipitin test also helped biologists gain acceptance by old-line conservation agents who had hitherto considered them ivory tower college boys. It was another example of research paying off in the everyday world of wildlife management.

It is not always easy to distinguish where



Biologist Allen Brohn, with LeRoy Korschgen, developed the precipitin test used by conservation agents to identify wildlife carcasses in suspected poaching cases. Brohn became Game chief in 1968 and assistant director in 1969.

research, management and services differ. A good case in point is the predator control program of the Department. When the Commission came into being it almost immediately came into a controversy about foxes. For a fox hunter there are almost never enough foxes, especially red foxes. To the farmer of that day, foxes were too numerous and they demanded relief. Sportsmen, too, were concerned about predation, shooting house cats, hawks, owls and foxes indiscriminately as competitors for the game they hunted. The whole question of predation was a complicated one.

The first attempt at control was to hire a hunter and assign him to a couple of counties to reduce local fox populations. The attempt was only moderately successful. In 1945, the Department hired Lewis J. McIntosh and in 1946, Robert H. Smith; they had both

been trappers with the federal government. There gradually evolved what has become known as the Missouri system of predator control.

McIntosh and Smith became essentially extension trappers, going to areas where local farmers were having troubles with foxes and coyotes, and teaching farmers how to trap for the specific animals causing the damage. This approach was so successful that farmers immediately reported eighty percent reductions in predator-caused losses. It was a rifle approach to control problem individuals, instead of declaring war on the whole species. Other states have since adopted the same system, with similar results.

Much light was shed on the role of predators by studies undertaken by biologist LeRoy J. Korschgen, who was assigned to food habits research. Korschgen determined that preda-



Biologist LeRoy Korschgen was the closest thing to a pure scientist the Department had, though his food habit studies were of great practical application in understanding predator/prey relationships.

tors were not nearly as bad as imagined, either as predators on domestic animals or game species. The Commission extended protection to many predator species, and in some cases took advantage of their sporting qualities with open seasons. The public's views have changed over the years as the result of educational campaigns, and hawks strung up on the fence have disappeared along with demands for extermination of predators like coyotes and foxes.

Today, the Department has three wildlife damage specialists whose services are available to landowners, and they deal not only with predators, but all species of wildlife that become nuisance animals, from coyotes to deer and birds. Research developed the techniques and approach to wildlife damage; manage-

ment and services make the benefits available to the public.

Wildlife management lands, now embracing 161 areas totaling over 400,000 acres, can be said to have started with acquisition of Peck Ranch lands in 1945. Six miles square, it became the focus of deer and turkey restoration efforts. Another major acquisition was the August A. Busch Memorial Wildlife Area in 1947. Its initial use was for field trials, wildlife management demonstration and fishing for the St. Louis area. Waterfowl area development began with the 1947-48 purchase of the Fountain Grove area in Linn and Chariton counties. As Canada goose populations developed, the Department signed a 1955 agreement with the U. S. Fish and Wildlife Service to create a public hunting area

at Swan Lake National Wildlife Refuge. Duck Creek waterfowl area was begun in 1952.

A number of areas were acquired as part of the upland game habitat restoration programs, and acquisition of wildlife lands in general has speeded up since 1977 with passage of the conservation sales tax under the *Design for Conservation* program. Wildlife Division areas are managed for a variety of primary uses, such as wetland wildlife, upland wildlife, forest wildlife, prairie preservation, or refuge, but also for multiple uses including fishing, natural history and conservation education. The intent is to maintain high wildlife populations for public recreation of all types.

Today's Wildlife Division had its inception in the Refuge Section of the old Fish, Game and Forests Division of 1937. At the time, refuges were the only wildlife program of the

Department. It wasn't until the first biologists were hired under the Pittman-Robertson Federal Aid to Wildlife Act that modern wildlife management started.

Game and Refuges, supervised by Bruce Lewis, continued alongside Federal Aid as a section until 1947, when a Game Section was created to replace the refuge section with Paul Q. Tulenko as the first chief. Federal Aid Section was renamed Wildlife Research in 1964, when the Game Division was created as a separate entity. Game Division was renamed Wildlife Division in 1973, reflecting its changing role in management of species of wildlife other than game species.⁴

Wildlife Division presently has four sections: Land Management; Administration, including planning, coordination and special programs; Wildlife Research; Wildlife Services,



Charles E. Ted Shanks, Wildlife Division chief from 1964 until his death in 1968, releases a banded mallard in 1949 for waterfowl mortality and movement research.

⁴ Chiefs of the units that became Wildlife Division include Arthur L. Clark (1938-1944), Melvin O. Steen (1944-1956), Larry R. Gale (1957-1964), Charles E. Ted Shanks (1964-1968), Allen Brohn (1968-1969), Dunbar Robb (1969-1971), Mike C. Milonski (1971-1976), Dean A. Murphy (1976-1984). Since 1984, Kenneth M. Babcock has been division chief.

including private land programs, plus an agricultural liaison position. The Division budget in 1985 was nearly \$6 million, and there were 127 permanent, eleven term and many seasonal employees. The Division's equipment inventory is valued at nearly \$3 million—a far cry from the days when field personnel were scrapping with one another for the use of a few slip scrapers to dig ponds.

The Administration/Coordination Section, currently headed by George P. Dellinger, oversees the Division's fiscal responsibilities, planning for wildlife on Department lands and statewide, coordinating wildlife projects with related agencies, and implementing special projects like wildlife reintroductions, special permit programs and the donation program.

The A/C Section oversees the turkey trapping program, which continues to trap Missouri turkeys for use in trades with various states for other wildlife species. In 1984-85,

for example, 192 turkeys were traded to Indiana, Kentucky, Illinois and Wisconsin for ruffed grouse and river otters. Since 1982 there have been 202 otters released at eleven different sites in Missouri. In 1984, there were 44 ruffed grouse released at nine sites, all resulting from turkey trades. Over the years 2,266 turkeys have been traded for fish, grouse, pheasants, otters and prairie plant seeds.

The A/C Section also oversees the giant Canada goose restoration program. Begun in 1978 as a direct result of twenty-five years of research, giant Canadas by the thousands now reside in many different areas of Missouri.

The A/C Section's planning function involves management plans for Department areas, planning for preservation of species like prairie chickens, and habitat management planning. Its coordination activities include



Don Starkey, left, late president of the Missouri Trappers' Association and Dave Erickson, right, inspect one of four male otters purchased by the Association and donated to the Department's restoration effort. Evidence indicates otters are once again breeding successfully in the state.



Two pioneers in the restoration of the giant Canada goose to the state were biologists Richard Vaught, left, and Harry Deming, right. They led the way in introducing washtub nesting at Trimble Wildlife Area.

working with Mark Twain National Forest, Ozark National Scenic Riverways, Army Corps of Engineers, Soil Conservation Service, and levee and drainage districts that have solicited Department assistance in habitat improvement.

The A/C Section's agricultural liaison program, currently headed by Raymond D. Evans, grew out of declining wildlife conditions on private land and the need for closer contact with agriculture programs at the state and federal level. Evans' job involves liaison work with the University of Missouri and private, state and federal agencies dealing with agriculture. The goals are to encourage awareness of the positive and negative aspects of farm programs on wildlife, encourage research and development of farming systems beneficial to wildlife, and oversee the orderly flow

of agriculture/wildlife information between farming and wildlife groups.

Wildlife's Land Management Section,⁵ presently headed by Jim L. Choate, oversees the management of 161 areas totaling 400,430 acres, including six waterfowl refuges totaling 23,000 acres. It also manages thirty prairie areas comprising 8,360 acres. Of the total, 201,832 acres are Department-owned and 206,958 acres are under license or lease with other agencies. The state is divided into districts, north and south, with district supervisors and staff support of area managers, area assistants and aides. Management emphasis varies, depending on the lands, but includes upland, wetland and forest wildlife, natural history, fishing, stream access, educational or refuge. The areas get heavy use. At wetland areas in 1985, there were 31,982

⁵ The Wildlife Management Section was created in 1984 from several different units. Among those heading up various wildlife management units over the years were Bruce Lewis, George Quinn, George Laun, Harold V. Terrill, Allen Brohn, Dunbar Robb, Mike C. Milonski, Robert Dunkeson, Richard Vaught, George Dellinger and Kenneth M. Babcock.

waterfowl hunter trips, 7,824 small game hunter trips, 135,090 fishing trips and 160,116 other users.

The Wildlife Research Section, which grew from the old Federal Aid Section, is currently supervised by Oliver Torgerson. There presently are twenty-five research biologists and support personnel. The section provides a continuing information base for the division and the Department. Major areas of investigation include wildlife harvests and hunter statistics and studies of deer, bobwhite quail, wild turkey, furbearers, waterfowl, rabbits, mourning doves, squirrels, prairie chickens, pheasants, ruffed grouse, non-game species such as Indiana and gray bats, songbirds, small mammals and trumpeter swans.

The Wildlife Services Section, with Sam B. Kirby as superintendent, now includes the old Field Service Section, which was trans-

ferred from Field Division in 1977 but has other functions as well. Field Service agents are now known as Wildlife Services biologists and there are twelve of them scattered over the state. Their job remains the same: getting wildlife management programs on privately-owned land and working with state and federal agencies that may be involved in wildlife programs.

The section oversees the extension wildlife damage control program, administers the PAWS program and runs two demonstration farms (in Lawrence and Worth counties) where economically sound farming practices and wildlife management are featured. Five private land specialists work with the Soil Conservation Service, training and assisting their employees to plan for wildlife benefits as they consider erosion control practices. To aid habitat restoration for upland wildlife,

Species	1935-36		1985
Quail	1,521,000		1,076,192
Ruffed Grouse	—	closed 1905; opened 1983	47
Prairie Chicken	—	closed 1907	—
Pheasant	—	closed 1907; opened 1954	46,085
Turkey	500	closed 1938; opened 1960	37,575
Dove	100,000		802,636
Geese	No data		50,380
Ducks	No data		181,662
Deer	82	closed 1938; opened 1944	86,432
Squirrels	2,000,000		1,238,649
Cottontail	4,500,000	(Over 1 million were commercial trade)	1,345,372
Opossum	221,700		37,705
Skunk	121,648		323
Civet	20,753		14
Raccoon	15,644		143,122
Muskrat	67,058		25,501
Mink	11,598		4,101
Red Fox	5,458		2,366
Gray Fox	2,933		3,968
Weasel	4,585		11
Otter	12	closed 1937	—
Beaver	—	closed 1929; opened 1953	5,781
Coyote	1,000		8,910
Bobcat	326		692
Badger	none recorded in the state		6 7

A table compiled by Wildlife Division shows the ups and downs of wildlife harvests during the past fifty years.



Dunbar Dixie Robb, left, played a major role as biologist in deer restoration efforts. He became Wildlife Division chief in 1969, but succumbed to cancer in 1971. Dean A. Murphy, right, began his career as a deer biologist and became Wildlife Division chief in 1976. In this 1960 photo, he is involved in researching the effects of dieldrin on wildlife.

the grassland management program assists private landowners by loaning specialized planting equipment and providing technical information.

All this is far different from the early days when a handful of biologists were sent out into the state to do something for wildlife. Utilizing the most modern research methods involving computer data banks and sophisticated management techniques, the Wildlife Division has a better knowledge of wildlife, the conditions affecting wildlife and what can be done about them, than ever before. There have been losses and gains. Some small game species have declined over the years, while other species have been brought back from near-extinction to abundance. New species have been introduced and extirpated species are being brought back. The future has its bright spots and its chal-

lenges.

Plans call for more intensive development of existing areas, purchase of four to six new upland areas and three new wetland areas, and intensified small game management on both public and private lands. Big game restoration-deer and wild turkey-is a resounding success and needs only continued careful management in the years ahead. The restoration of river otters, ruffed grouse and species like trumpeter swans is under way. Attention is being focused on other non-game species and they increasingly will be subjects for study and management.

The Wildlife Division is in a better position today to meet the challenges than it was in those dark days of the 1930s, thanks to the far-seeing biologists and administrators who laid the foundation for today's wildlife management programs.